

SEP 22 1964

Bulletin of the Museum of Comparative Zoölogy

HARVARD
UNIVERSITY

AT HARVARD COLLEGE

VOL. XCIV, No. 6

NOTES ON LYCAENID BUTTERFLIES

By HARRY K. CLENCH

CAMBRIDGE, MASS., U. S. A.

PRINTED FOR THE MUSEUM

JULY, 1944

Museum of Comparative
Zoology
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No. 6—Notes on *Lycaenid Butterflies*

BY HARRY K. CLENCH

a. THE GENUS *Callophrys* IN NORTH AMERICA

While working on a revision of the genus *Incisalia* Scudder such frequent recourse was had to the various American species of *Callophrys* that it was thought advisable to prepare a brief review of them. Unfortunately, time was all too short to do the job properly, and genitalic examinations were not made. These notes, however, were gotten together, in the hope that they would facilitate further work on the genus. Such future work should certainly include a genitalic study of all forms involved.

The first and only real revision of the American *Callophrys* was that of Barnes and Benjamin¹, who placed the genus on very solid footing, especially as compared with its previous state. It was through this paper that our first accurate knowledge of the limits and variabilities of the several species was obtained. There have remained, however, several points that need clarification. Probably the most important of these is the interrelationship of the various Californian forms. The arrangement adopted by Barnes and Benjamin (*dumetorum* in the north, with subsp. *perplexa* in the south) is too simple, and although it at first appears logical, subsequent research has proved it false. There are at least three forms, and very likely several more, in California that have been going under the names *dumetorum* and *perplexa*. What has been commonly passing as true *dumetorum* is something else, while true *dumetorum* itself appears to be rather poorly known. These will be discussed in greater detail under the species concerned. Unfortunately, the problem in California has been only partly solved, the material at hand indicating much further work to be done, but of itself insufficient to do it.

In addition to this, there has been a new species (*comstoeki*) proposed since the work of Barnes and Benjamin, and in the present paper a second novelty, a new subspecies of *affinis*, is added.

Finally, there are a number of new and interesting records, extensions of ranges, particularly of *affinis* and *sheridanii*.

The genus in North America appears to be confined exclusively to the Rocky Mountains and the area westward to the Pacific. It extends from northern Mexico in the south to Alberta and British

Columbia¹ in the north. The species appear to be generally mountain-loving, although they are frequently (*perplexa*, for example) taken at low elevations.

The paucity of species in Asia and Europe and their close inter-similarity, as compared with the relatively large (6) number of species and their diversity here in America, would suggest that the Palae-arctic species were derived from American stock. The origin of this American stock, however, is quite another question, and one foolish to speculate upon, in view of our present ignorance of much of the pertinent details.

The author wishes to thank the several individuals and institutions who have greatly assisted in this review. The American Museum of Natural History (AMNH) very kindly loaned some material for study. The Carnegie Museum and the U. S. National Museum checked the types of species in their collections. Mr. Robert G. Wind, of Berkeley, California, was very kind in sending me for study a large amount of exceedingly interesting material, including a number of the complex *viridis*-like specimens from the Californian Sierras, and other northern Californian localities. Mr. Charles L. Remington also lent some very interesting material which was of the utmost help in preparing the paper. Mr. L. P. Grey gave the author all of his *Callophrys*, which included several very interesting things. The collection of the Museum of Comparative Zoölogy (M.C.Z.) has, as in times past, always been available to me through the kindness of Mr. Banks. This collection contains much material of interest and assistance. My own collection has been drawn on wherever possible, being designated (H.K.C.).

Genus CALLOPHRYS Billberg

1820, Enumeratio Insectorum, p. 80. Genotype, *Papilio rubi* Linn. (Palae-arctic).

Key to species

1. Fore wing underside with green covering wing down to Cu_2 or $2A$ 2
- This green restricted to a more or less broad costal and outer marginal border, leaving a large internal area of gray or fulvous 6

¹The two papers on the faunae of these provinces (K. Bowman, 1919, Annotated Check List of the Macrolepidoptera of Alberta, Alberta Nat. Hist. Soc., Red Deer, Alta., 16 pp.; E. H. Blackmore, 1927, Check-list of the Macrolepidoptera of British Columbia, C. F. Banfield, Victoria, B. C., 47 pp.) each list *Callophrys dumetorum*. Just what they meant is not known. Indeed, it could have been almost any species in the genus, but most logically *affinis* or *sherdanii*. References to these papers, as well as to a number of others, were omitted due to this and similar lack of precise information, so common in this genus.

2. Hind wing below immaculate, or at most with a faint indication of a white line—usually a discal row of obscure white dashes 3
 - This wing with either a prominent white line, or with a series of distinct, pure white dashes or dots 4
3. Fulvous above in both sexes widespread, dominant; underside apple-green *a. affinis*
 - Fulvous above reduced, frequently (usually?) absent in the male; green below purer, inclining even to bluishness *affinis washingtonia*
4. Underside of hind wing with a solid line of white 5
 - This surface with a row of prominent white spots *viridis*
5. Line on underside of hind wing heavy, inwardly edged with a pronounced band of black *s. sheridanii*
 - This line thin; the black faint or absent *sheridanii neoperplexa*
6. Underside of hind wing nearly immaculate, or with a row of white spots of varying number 7
 - This area with a crooked white line 8
7. Outer margin of fore wing evenly convex *apama homoperplexa*
 - This margin convexly angled at M_2 or thereabouts, and straight, or slightly concave thence to the inner angle 9
8. Line on underside of hind wing basally edged with black, then fulvous *a. apama*
 - This line with no fulvous *comstocki*
9. Costa of fore wing below edged with fulvous *dumetorum perplexa*
 - Costa of this surface not edged with fulvous (or at most only very slightly) *d. dumetorum*

CALLOPHRYS DUMETORUM Boisduval

This species ranges from northern Mexico (Baja California) north beyond San Francisco. The northern limits of its range are still undefined. There are apparently two subspecies of this, one very widely known (*perplexa*), inhabiting the lower part of its range, and the other (typical *dumetorum*) much less perfectly known, inhabiting the upper. It is possible that the latter as considered herein consists in reality of several subspecies.

The species shows several characters that place it close to *apama*. The principal one of these is the large fulvous or gray area on the fore wing below. The chief constant difference between the two (*apama homoperplexa* and *dumetorum perplexa* approach each other so closely that aside from this basic character they are almost inseparable) lies in the shape of the outer margin. In *dumetorum* it is convexly angled in the vicinity of M_2 , and straight or slightly concave below it to the inner margin, while in *apama* the whole margin is evenly convex.

CALLOPHRYS DUMETORUM DUMETORUM Boisduval

Thecla dumetorum Boisduval, 1852, Ann. Soc. Ent. France (2) 10, p. 291; Oberthur, 1913, Et. Lep. Comp. 9, p. 40, pl. 236, fig. 1926; Draudt, 1919, in Seitz, Macrolep. World, 5, p. 763, pl. 154b; id., 1924, p. 1043. (all *partim*)

Thecla dumetorum: auct. (*partim*)

Callophrys dumetorum: auct. (*partim*)

The type, in the United States National Museum, came from California. No definite locality was designated. Due to a lack of material agreeing satisfactorily with the description and with Oberthur's figure of the type (loc. cit.) no type locality has been fixed.

Localities. California: Phelan; Snow Creek; Dana Point (all H.K.C.); Pasadena (M.C.Z.); Calistoga; Petrified Forest (both in the collection of R. G. Wind). These are all doubtfully typical *dumetorum*.

Male above uniform brownish gray. Fringe white, basally gray. Female similar but more brownish, and with a discal fulvous suffusion.

Male below with fore wing gray or fulvous, inner margin somewhat paler. Costa and outer margin as far down as Cu_1 green. Hind wing uniform green with two or three white spots, the principal ones being on the costa and in the Cu_1 - Cu_2 interspace. Fringe gray, slightly paler outwardly and at the vein-ends on the hind wing. Female similar, but with the gray area on the fore wing more fulvous. Both sexes frequently have a more or less strongly developed discal line on the fore wing, usually merely an intensification of the gray or fulvous.

Length of fore wing. Male, 12.5-13 mm.; female, 13 mm.

The above rather brief description is based on three males and a female (two males from Phelan, one from Snow Creek, and a female from Dana Point) which may or may not be typical *dumetorum*. Several points in Boisduval's description differ from those found in these specimens (namely, the fulvous (of Boisduval) instead of gray color of the large area on the fore wing below; the presence of a number of white spots on the hind wing below, lacking in the above-described specimens). Typical *dumetorum* was very likely described from much further north than these four specimens, although just where is still unknown. The Calistoga specimens, while apparently approaching Boisduval's description a little more closely than these, still differ enough to be closer to the more southern specimens.

These specimens, of what is here taken to be typical *dumetorum*, differ from *perplexa* in the absence of fulvous edging on the costa of the fore wing below, and (in the male) by the gray, instead of fulvous, area on this surface. There are, however, hints of fulvous on this area,

but this may possibly be explained by the fact that the specimens came from a region not too remote from the home of true *perplexa*.

Two of the three *Calistoga* males examined have a definite fulvous shading on the hind wing above, and one of them a patch on the fore wing as well. More specimens are needed to tell whether or not this is a local race of *dumetorum*. This character is quite unusual for *dumetorum* and appears not to have been noticed previously.

CALLOPHRYS DUMETORUM PERPLEXA Barnes and Benjamin

Thecla affinis: auct. (*partim*)

Thecla dumetorum: auct. (*partim*)

Callophrys dumetorum: McDunnough, 1914, Ent. Rec. and Journ. Variation, **26**, p. 196. (*partim*)

Callophrys dumetorum race *perplexa* Barnes and Benjamin, 1923, Contrib. Nat. Hist. Lep. North America, **5**, p. 65; Draudt, 1924, in Seitz, Macrolep. World, **5**, p. 1043. Comstock, 1927, Butterflies of California, p. 168, pl. 50, figs. 17, 18, 19 (*partim*); Hoffman, 1940, Anales Inst. Biol. Mex., **11**, p. 708 (no. 623).

Holotype, allotype and a number of paratypes in the United States National Museum. Described from San Diego, California.

Other localities. California: Pine Valley; Corona; Balboa; El Modena (all in coll. H.K.C.). Mexico: (northern localities, adjacent to California).

Differs from typical *dumetorum* (as considered in this paper) in the fulvous edging on the costa of the fore wing below, and in the increased fulvous in the discal region of this same surface.

Apparently restricted to southern California and adjacent Mexico.

Length of fore wing. Male, 11–13.5 mm.; female, 11.5 mm.

CALLOPHRYS COMSTOCKI Henne

Callophrys comstocki Henne, 1940, Bull. So. Cal. Acad. Sci., **39**, p. 71.

Holotype and allotype from the Providence Mts., San Bernardino County, California, in the collection of the Los Angeles County Museum. Paratypes from the same locality in the United States National Museum, Canadian National Collection. Also (?) in the collections of C. H. Ingham and C. Henne.

Topotypes have been examined from the collections of A. C. Frederick, D. B. Stallings and the author.

Above, both sexes slate gray. Male with a small oval scent-pad. Fringe gray, paler outwardly. Hind wing but slightly scalloped.

Below, both sexes flat grayish green. Fore wing with inner marginal area, centrally as far costad as M_3 , gray. This wing crossed by an obsolescent post-discal line of white, basally gray-black, dashes. Hind wing with a similar, but more distinct, line, edged basally with black. This line outwardly displaced in M_3 - Cu_1 , and irregular thence to the inner margin. Fringe of both wings basally gray, outwardly white.

Length of fore wing. Male, 10-11 mm.

Closest to *apama*, but differing in several respects, principally the gray upper surface of both sexes, and the flat green below, unrelieved by any fulvous shading. It is a very interesting and isolated species, possibly a local modification of *apama*, but certainly distinct enough to warrant full specific distinction. So far as known it is restricted to the Providence Mts.

CALLOPHRYS APAMA Edwards

This species occurs over a relatively compact range from Arizona to New Mexico and north to Colorado, becoming differentiated in the latter regions into a distinct subspecies. The limits of range of this species are fairly well-known. It may, however, be turned up in eastern California (doubtful) or southern Utah. (The Carnegie Museum has a single male from this state; I have not seen it.)

From its near relative, *C. dumetorum*, *apama* may be distinguished by the character given above under the general remarks for *dumetorum*.

Another close ally (perhaps its closest) is the recently described *C. comstoeki*. This latter may be separated at once by its complete lack of fulvous shading on the underside, by its smaller size, and by the more distorted, less prominent white discal line on the hind wing below.

CALLOPHRYS APAMA APAMA Edwards

Thecla apama Edwards, 1882, *Papilio*, 2, p. 137; Draudt, 1919, in Seitz, *Macrolep. World*, 5, p. 763; id., 1924, p. 1043.

Callophrys apama: Barnes and Benjamin, 1923, *Contrib. Nat. Hist. Lep. North America*, 5, p. 67.

Type locality. Fort Grant in the Graham Mts., Arizona. One male and two females labelled "Arizona" in the Edwards collection at the Carnegie Museum. One of the latter made a lectotype by Holland.

Other localities. Arizona: Oak Creek Canyon (6000 ft.) (M.C.Z.); White Mts.; Catalina Mts. (both in coll. H.K.C.); Navajo Mt. (in

coll. R. G. Wind); Sierra Ancha Mts. (in coll. P. S. and C. L. Remington).

Above in the male dark gray with a brownish tinge. A small, almost circular scent-pad at the upper cell-end. Fringe of fore wing concolorous with ground (or slightly darker), paler outwardly; of hind wing similar, but frequently almost pure white outwardly; tips of veins Cu_1 , Cu_2 , and 2A usually white.

Female similar, but with fulvous patch on fore wing and usually on hind wing. Fringe outwardly slightly paler.

Below, fore wing largely fulvous. Inner margin gray. A post-discal, white irregular line crosses from costa to Cu_2 , composed of white dashes, basally edged with black. Base of wing and apical area outside of post-discal line (and extending down as far as Cu_1) green. Hind wing green. A post-discal line, similar in construction to that of the fore wing, but here more tortuous, crosses from costa to inner margin, outwardly displaced often in the form of a crude "W" in the M_3 - Cu_2 region. Basal to this line runs a closely adherent band of fulvous. Occasionally there is a definite suggestion of a Cu_1 - Cu_2 submarginal spot. Fringe of fore wing basally dull fulvous, outwardly gray; of hind wing similar, but paler outwardly and tipped at Cu_1 , Cu_2 and 2A with white.

Length of fore wing. Male, 10.5-13 mm.; female, 10.5-11 mm.

The typical subspecies is distinguished from its Colorado representative by the clarity and completeness of the markings below, which are reduced frequently to the point of complete obscurity in *homoperplexa*.

CALLOPHRYS APAMA HOMOPERPLEXA Barnes and Benjamin

Thecla dumetorum auct. (*partim*)

Callophrys apama race *homoperplexa* Barnes and Benjamin, 1923, Contrib.

Nat. Hist. Lep. North America, 5, p. 68; Draudt, 1924, *in* Seitz, Macrolep. World, 5, p. 1043.

Holotype, allotype, and several paratypes in the United States National Museum. Holotype and allotype from Denver, Colorado. Paratypes from Golden, Boulder, and Denver, Colorado.

Other localities. Colorado: Durango; Husted and Starr Ranch (El Paso County) (all M.C.Z.); Boulder Canyon; Eldora (both in coll. P. S. and C. L. Remington). New Mexico: nr. Hot Springs, Las Vegas (7000 ft.); Rincon (both in M.C.Z.). Specimens from Golden have also been examined.

On the upperside it differs apparently only in the more fulvous shading of the female, and a greater tint of fulvous in the male.

On the underside the differences are much more pronounced. *Homoperplexa* lacks, in varying stages of completeness, the white discal lines on each wing which form such a conspicuous part of typical *apama*. The green on the fore wing appears to be more greatly extended.

Length of fore wing. As in the typical subspecies.

This subspecies is very interesting, and would seem to point towards a connection with *affinis*. This at first implausible suggestion becomes more likely when one notices that males of this subspecies are frequently dull fulvous, and that occasionally specimens are found in which the green of the underside of the fore wing covers an abnormally large part of the wing, or shows itself faintly as a discal green suffusion. Another point in favor of this alliance is the tendency of *affinis* to produce specimens with hints (sometimes startlingly complete) of a discal white line on the hind wing below. Yet another point is that the ranges of the two do not apparently overlap, or if so, they only occur sympatrically in a very restricted area. More material is needed from the zone of transition (northern Colorado and adjacent regions) to prove or disprove this.

Prior to the work of Barnes and Benjamin, this subspecies was completely confused with *dumetorum perplexa* (*dumetorum* auct.) of southern California, and very understandably so. The two are strikingly similar, and frequently almost the only real point of distinction (superficial) is the difference in the fore wing outline. In general, however, males of *homoperplexa* have a more ruddy upper surface than do males of *perplexa*. The green below of *homoperplexa* tends to be somewhat more brassy than that of *perplexa*.

Extreme *homoperplexa* lacks any suggestion of the discal line on either wing below. Throughout Colorado, however, and particularly in the southern part of the state specimens are frequently found that tend quite definitely toward the typical subspecies. The two New Mexico examples (localities given above) are in this category as well. Apparently *apama* is restricted to Arizona.

CALLOPHRYS AFFINIS Edwards

The exact range of this species is not yet known. It extends, from the material and information at present available, from Utah north to Wyoming and Washington. It may possibly occur in Colorado also.

The Washington specimens appear sufficiently distinct to warrant separate racial consideration. Wyoming specimens appear to be transitional in some respects, but are referred at present to the typical subspecies.

This species is distinguished by its large, usually entirely unmarked green under surface, and (with the exception of the Washington race) large amount of fulvous above in the male. Both *dumetorum* (*Calistoga*) and *apama homoperplexa* have this suffusion in the males, but not to the extent of typical *affinis*.

CALLOPHRYS AFFINIS AFFINIS Edwards

Thecla affinis Edwards, 1862, Proc. Acad. Nat. Sci. Philadelphia, p. 223;

Draudt, 1919, in Seitz, Macrolep. World, 5, p. 763; id., 1924, p. 1043.

Callophrys affinis: Barnes and Benjamin, 1923, Contrib. Nat. Hist. Lep. North America, 5, p. 66.

The types, one male and one female, from Utah, are in the Carnegie Museum. Silver Lake, Utah, is here selected as the type locality, based upon two males and two females in the M.C.Z. Barnes and Benjamin (loc. cit.) referred to some specimens from Silver Lake as topotypes, but did not elaborate.

Other localities. Wyoming: Teton Mts. (in coll. R. G. Wind).

Edwards' description of this species is very good, and is quoted here: "Both sexes glossy red brown, brightest in female; the male has a smooth oval spot on disc of primaries; costa of primaries and base of both wings blackish brown; whole hind margin edged with same color; fringe white.

"Under side uniform apple green, except on inner margin of primaries, where it is pale, brownish grey; both wings immaculate; costal edge of primaries grey; hind margin of secondaries without crenations."

Length of fore wing: Male, 12-13 mm.; female, 12.5-13.5 mm.

The typical form is large and bright. It differs from *washingtonia* in the shade of apple green below, and in the large extent of fulvous on the male above.

CALLOPHRYS AFFINIS WASHINGTONIA, new subspecies

UPPERSIDE:

Male. Both wings dark gray, slightly brownish, and occasionally suffused with dull fulvous in the disk. *Fringe* white, basally dark gray.

Female. Similar to the male, but with the fulvous more extended.
UNDERSIDE:

Male. Both wings green, slightly bluish, and very faintly brassy. Inner margin of *fore wing* to 2A, and frequently to Cu₂, gray. *Hind wing* occasionally with the merest suggestion of a spot in the Cu₁-Cu₂ interspace.¹ *Fringe* white, slightly darker at the vein-ends on the hind wing.

Female. Similar to the male, but with the addition of a very thin, extreme marginal line of white, running from anal angle to M₁. This is very likely an individual variant, and will probably not be found to hold true for other females. At the anal angle is a very small white patch, the origin of the white line, and probably also merely an individual variation.

Length of fore wing. Male, 11-12.5 mm.; female, 12 mm.

Holotype. Male, Alta Lake, Washington, April 25, 1935 (J. C. Hopfinger) ex coll. P. S. and C. L. Remington.

Allotype. Female, same data as holotype.

Paratypes. Two males, Brewster, Washington, May 9, 1939 (J. C. Hopfinger?), ex coll. L. P. Grey.

Holotype and allotype, no. 26259 in the M.C.Z. Paratypes in the author's collection.

Remarks. Differs from typical *affinis* in the much more reduced fulvous above in both sexes, and in the more bluish tone of the green below.

A series of over 15 examples from the Teton Mts., Wyoming, seems about intermediate between *washingtonia* and true *affinis*. There is, however, little if any variation in the amount of fulvous on the fore wing above in the male, while this character in *washingtonia* varies from a limited amount (smaller than the smallest of the Teton Mts. specimens) to none at all. In several of the Wyoming specimens there is an indication of a tendency to produce a row of white dashes on the hind wing below; in one specimen quite strongly.

CALLOPHRYS VIRIDIS Edwards

Thecla viridis Edwards, 1862, Proc. Acad. Nat. Sci. Philadelphia, p. 223.

Thecla dumetorum: auct. (*partim*)

Callophrys dumetorum: Barnes and Benjamin, 1923, Contrib. Nat. Hist. Lep. North America, 5, p. 64 (*partim*); Comstock, 1927, Butterflies of California, p. 168, pl. 50, figs. 16, 20, 21, 25 (some of these are apparently *dumetorum*) (*partim*).

¹ The allotype has an indication of dashes in other neighboring interspaces, as well as a row of very faint dashes on the fore wing. This latter can be seen faintly in certain lights in one of the paratypes.

The type locality is here selected as San Francisco, California, based on a female in the collection of P. S. and C. L. Remington (May 8, 1934, Wm. Hovanitz collector) that agrees excellently with the original description. In the absence of any type at the Carnegie Museum this specimen is here made the neoholotype.

Other localities. "California" (M.C.Z.).

The male is above uniform gray. Fringe white, gray basally and at the vein-ends of the hind wing. Female similar, but *may* be largely suffused with fulvous, leaving a dark base, costa and outer margin on the fore wing, and a dark base only on the hind wing.

Below in both sexes both wings are uniform pea-green. Fore wing with inner marginal area to vein Cu_2 gray, save on outer margin, where the green extends down to 2A. Costa edged with fulvous. In the disk is a faint row of dull white dashes, three in number in the specimen examined, in interspaces $M_2-M_3-Cu_1-Cu_2$. On the hind wing this row is continued, commencing at the outer angle and proceeding to just basad of the anal lobe on the inner margin. The marks composing this line are rather displaced and irregular in size, the one in Cu_1-Cu_2 being the largest. Those on the fore wing and one on the costa of the hind wing are basally edged with dark brown or black. Fringe of both wings white, rather dull, and basally slightly darkened.

Length of fore wing. Female, 13.5 mm. (neoholotype).

This species, heretofore considered synonymous with *dumetorum*, is perfectly valid. *Dumetorum*, as described by Boisduval,¹ has a large fulvous area on the underside of the fore wing, lacking in *viridis*. This character (the extent of the green on the underside of the fore wing), which so far as known is very constant and subject to almost no individual variation,² is alone enough to raise Edwards' name from the synonymy. Oberthur's figure of the type of *dumetorum*. (loc. cit.) confirms Boisduval's description in this respect. True *dumetorum* has been discussed further above.

Even with *viridis* and *dumetorum* separated, the picture is still anything but clear. In California, apparently right along with *viridis*, occurs a very green form with an immaculate underside. With only a limited number of specimens available, it has been impossible to determine whether this is a distinct species or merely an extreme of *viridis*. Either is quite possible, although the latter is the more probable.

¹" . . . et le disque des ailes supérieures est beaucoup plus largement roussâtre, ce qui fait que le vert domine moins." (reference under *dumetorum*).

²There is a certain amount of individual variation in this character in *C. apama homopleroptera*, as has already been noted, but this is apparently an indication of transition towards another species (*affinis*), and as such is excusable.

Several specimens of *Callophrys* have been examined from the collection of Mr. R. G. Wind, having been collected by him chiefly in the Sierras. These, while apparently close to *viridis* differ in several respects from it. These specimens, however, also differ considerably *inter se*, so that in the absence of genitalic examination or larger series, nothing further can be said.

CALLOPHRYS SHERIDANII Edwards

This species occupies a long, narrow, mountainous strip from Clouderoft, New Mexico north as far as Brewster, Washington. It is differentiated into at least two subspecies, the typical occurring in Wyoming, Colorado and probably New Mexico, while the subspecies *neoperplexa* ranges from Utah north to Washington. Specimens from the latter locality do not seem exactly typical of *neoperplexa* and when more specimens are available they may be found to belong to a distinct race.

The chief character whereby this species may be differentiated from any other now known is the long, nearly straight (usually) white line on the hind wing below, frequently basally bordered with black. It is also one of the smaller species of the genus.

CALLOPHRYS SHERIDANII SHERIDANII Edwards

Thecla sheridanii Edwards, 1877, in Carpenter, Field and Forest, **3**, p. 48 (*lapsus calami*).

Thecla sheridanii: Draudt, 1919 in Seitz, Macrolep. World, **5**, p. 763; id., 1924, p. 1043.

Callophrys sheridanii: Barnes and Benjamin, 1923, Contrib. Nat. Hist. Lep. North America, **5**, p. 66.

In the Carnegie Museum is one female labelled "Bighorn, Mont." (*vide* Sweadner, *in litt.*) here selected as neoholotype. Holland's selection of a lectotype from Denver, Colorado is invalid as that is definitely *not* the type locality.

Other localities. Wyoming: Teton Mts. and vic. (A.M.N.H.). Colorado: Chimney Gulch (M.C.Z.); Ft. Collins; Denver (both Barnes and Benjamin, p. 66); Eldora; Ceal Creek (both in coll. P. S. and C. L. Remington). New Mexico: Clouderoft (M.C.Z.).

Male above dark gray with a slight brownish tinge. A small oval scent-pad at the upper cell-end. Fringes of both wings white, gray basally. Female similar, but lacking the scent-pad.

Male below with both wings slightly brassy green, irrorated faintly,

especially on the hind wing, with obscure black scales. Fore wing with inner margin gray-brown. A post-discal line crosses from costa to Cu_2 (occasionally with an inwardly dislocated extension in Cu_2-2A), white, and basally narrowly lined with black-brown. Hind wing with a similar line, but heavier, and running from costa to inner margin in a nearly straight line (frequently dislocated, but seldom if ever curved). A small, white cell-end spot is occasionally present. Fringe as on upper surface, but slightly greenish towards outer angle. Female as in the male.

Length of fore wing. Male, 10–12 mm.; female, 11 mm.

The typical form differs from *neoperplexa* in the thicker white line below, and the more prominent basal black edging to this line. Barnes and Benjamin state that a specimen from Cloudercroft, New Mexico is closer to the subspecies *neoperplexa*. This is decidedly queer, if so, and is not borne out by the single specimen from that locality in the M.C.Z., which, although not perfectly typical, is close enough to belong here for the present.

CALLOPHRYS SHERIDANII NEOPERPLEXA Barnes and Benjamin

Callophrys sheridanii race *neoperplexa* Barnes and Benjamin, 1923, Contrib. Nat. Hist. Lep. North America, **5**, p. 67; Draudt, 1924, *in* Seitz, Macrolep. World, **5**, p. 1043.

Holotype and allotype from Eureka, Utah. Paratypes from Stockton and Silver Lake, Utah. Holotype, allotype and 2 male, 1 female paratypes in the United States National Museum.

Other localities. Montana: Polaris (H.K.C.). Washington: Brewster (H.K.C.). In the M.C.Z. is a series from Silver Lake.

Its differences as compared with typical *sheridanii* have been pointed out above. The Brewster, Washington, specimens do not agree perfectly with Utah *neoperplexa*, and may ultimately be found racially separable. They are very close, however, and for the present will be left under that name. It is possible that some of the Sierran material from California, mentioned under *viridis*, will prove to be southern extensions of *sheridanii* stock, racially modified.

Length of fore wing. Male, 10–11 mm.; female, 11–11.5 mm.

b. THE ACASTE GROUP OF THE GENUS THECLA

The species treated here form a more-or-less closely interrelated group isolated by Draudt (1919, *in* Seitz, Macrolep. World, **5**, p. 762) as the tailless section of his *amyntor*-group, of the genus *Thecla*. No

better classification can be made with accuracy at present, since the generic subdivision of the neotropical Theclinae is a task no one has yet attempted with any degree of completeness¹.

That the "tailless section" is here considered separately from the "tailed section" is due principally to a very great dearth of material of the latter. The two sections are apparently very closely allied, at least in appearance², and are separable only in minor characters.

The *acaste* group³ may be distinguished from the "tailed section" in the following external particulars: The anal angle of the hind wing is more produced, and the anal lobe is longer, more prominent. In general the tail is absent (see footnote no. 3) but if it is present it is coarser (broader) and proportionately shorter than those of the other section. Also on the hind wing, the vein-ends are here slightly more tufted. The green below is less uniform and usually less shining. The general appearance of this group is more reminiscent of *Callophrys*, or even, somehow, of *Incisalia*, while the others seem more typically Thecline.

The various members of the *acaste* group are of average Thecline size, ranging (in the length of the fore wing) from 12 (female of *remus*) to 16 mm. (female of *a. acaste*). The males all have scent pads⁴, but they are usually small and almost unnoticeable, occasionally being of the same color as the ground color, a rather unusual occurrence. The males are above (excepting *marialis*) some shade of blue or purple, very metallic, with dark borders of width varying with the species. The females on this surface are duller, the blue being considerably less metallic, and more basally restricted. Below the sexes are similar, with a rather similar basic pattern: ground color green; a post-discal line (outwardly white, basally dark) on both wings; a submarginal row of red spots on the hind wing; a marginal row of spots or patches, or a marginal band, on both wings; a basal quadrate patch of dark brown on the hind wing. Any or all of these may be suppressed or

¹The members of this section (perhaps even more so than those of the "tailed section") seem to bear affinity to the genus *Callophrys* Billberg. Indeed, W. D. Field (1939, Univ. Kansas Sci. Soc. Bull., 26, p. 347) has placed *Thecla herodotus* Fabr. (a member of the "tailed section") in this genus, without comment however.

²Due to the briefness of time available for study it was not possible to make any genitalic preparations. These, when examined, may show further, more real differences.

³So called in preference to the "tailless section" of Draudt, since that method of division has proved incorrect. *Thecla longula* (*pastor*) and *Thecla marialis*, both tailed species, are clearly members of the group now under consideration, while a tailless species, quite obviously belonging to the other section, is being described as new in another paper.

⁴Godman and Salvin (1887, Biol. Centr.-Am. Lep., Rhop. 2, p. 34) erroneously characterized *agricolor* as lacking a scent pad.

variously developed. An inner marginal band of tan or gray is always present on the underside of the fore wing.

The several species together occupy a wide range from Mexico to Bolivia and southern Brazil, and even Argentina. Our knowledge of the distribution of the individual species is very imperfect, and will probably remain so for some time to come.

Key to species

This key was very difficult to compose, and in parts may be inaccurate; it should be used, therefore, with this in mind. In several of the species but one sex is known, thus making it impossible to include characters which are definitely known to apply to both male and female of such species.

- 1. Frons brown 2
- Frons green 7
- 2. Outer margin of hind wing below with red-gray edging, either as a definite band, or as a series of internervular spots 3
- This margin without red-gray spots, being green, as in the rest of the wing 6
- 3. Outer margin of fore wing below with red-gray edging; a well-marked discal line as well on this surface *a. agricolor* (1)
- This margin without red-gray edging; discal line obsolescent or wanting 4
- 4. Tail at Cu₂ on secondary *longula* (5)
- No tail at Cu₂ 5
- 5. Small, expanse less than 30 mm. (usually about 26 mm.) *remus* (2)
- Larger, over 30 mm.; up to 32 mm. or so *agricolor bañosensis* (1a)
- 6. Male with scent pad black; underside nearly uniform green *longuloides* (4)
- Male with scent pad colored blue as in the ground color; below with bands of darker green *pseudolongula* (3)
- 7. Upperside of male brown; tailed at Cu₂ on secondary *marialis* (9)
- This surface of male bright blue; no tail at Cu₂ 8
- 8. White discal line on underside of hind wing (may tend toward obsolescence) 9
- No white discal line on this wing *legionis* (6)
- 9. White patch in center of gray area on underside of fore wing (only in male?) *portocna* (8)
- No white patch in this area, male or female 10
- 10. Submarginal red spots on underside of hind wing absent (almost or completely); white discal line prominent *acaste catharinensis* (7a)
- Submarginal red spots on underside of hind wing usually well-developed; discal white line obsolescent *a. acaste* (7)

1. *THECLA AGRICOLOR AGRICOLOR* (Butler and Druce)

Strymon agricolor Butler and Druce, 1872, Cist. Ent., **1**, p. 105; Butler, 1873, Lep. Exot., p. 158, pl. 57, fig. 4.

Thecla agricolor: Hewitson, 1877, Ill. Diurn. Lep. Lycaenidae, p. 201; Godman and Salvin, 1887, Biol. Centr.-Am. Lep. Rhop., **2**, p. 34, pl. 52, figs. 11, 12; Draudt, 1919, *in* Seitz, Macrolep. World, **5**, p. 762, pl. 154a; Hoffman, 1940, An. Inst. Biol. Mex., **11**, p. 707.

The type is in the British Museum, presumably. It was taken in Cartago, Costa Rica. Draudt gives the range as "Mexico to Panama." Godman and Salvin list Jalapa, Mexico; Dueñas, Guatemala; Irazu and Rio Sucio¹, Costa Rica; Bugaba and Chiriqui, Panama. Hoffman gives "Tierra templada de Vera Cruz. Sur de Puebla. Morelos. Valle de Mexico (2250 M.)." Specimens in the M.C.Z. are all from Jalapa, Mexico.

Above, in the male, metallic blue, duller than in the other species. Both wings with a rather indefinite and heavy dark border on the outer margin. Costa of fore wing narrowly black. Costa and inner margin of hind wing narrowly gray. Anal lobe of hind wing rusty, black-fringed. The scent-pad is very small, almost unnoticeable (see footnote, p. 230), and lies just beyond the upper cell-end.

Below, fore wing gray from inner margin to M_3 , darker adjacent to the cell. Remaining area green. Outer margin from apex to inner angle with a moderately heavy grayish border. A discal line of reddish crosses from costa, disappearing shortly below M_3 . A faint submarginal line behaves similarly. Hind wing with a broad marginal border, outwardly gray, basally reddish. The basal limit of this border is, in the M_3 - Cu_1 and 2A-inner margin interspaces, orange. A discal line of dark green and reddish scales crosses the wing obscurely. Base marked with a large, quadrate, almost black patch. Anal lobe maroon.

The female is duller above than the male, with the blue more restricted, leaving very broad costal and outer marginal borders on the fore wing, and a broad outer marginal border on the hind wing. It is almost exactly similar on this surface to *pseudolongula*, but the outer limit of the blue is more sharply defined.

Below, the female is similar to the male, but with the markings slightly brighter.

Length of fore wing. Male, 12.5–13.5 mm.; female, 14.5 mm.

¹Possibly this refers to a Rio Sucio in northern Colombia, emptying into the Gulf of Darien just below the south-eastern tip of Panama. The specimens on which this record is based may, therefore, be transitional to *bañosensis*.

1a. *THECLA AGRICOLOR BAÑOSSENSIS*, new subspecies

UPPERSIDE:

Female. Both wings bright metallic blue. *Fore wing* with a costal and outer marginal border of black-brown, covering the whole cell-end-to-apex region, and narrowing towards the inner angle. *Hind wing* with a gray costal border, becoming black-brown on the outer angle and outer margin. Inner margin gray. Anal lobe rusty, the color extending basad slightly, and costad as far as Cu_2 . *Fringe* of both wings black-brown, paler between the veins.

UNDERSIDE:

Female. Both wings green. *Fore wing* with a paler, apple-green marginal stripe and a discal row of three obscure red-brown spots (M_1 - M_2 - M_3 - Cu_1). Inner margin to Cu_2 gray, black basad, next the cell. Between the gray and the green, in the Cu_1 - Cu_2 interspace, is a band of fulvous. *Hind wing* with a small black basal patch, a discal transverse line of gray, thin costad of Cu_1 , heavier thence to inner margin. A submarginal row of obsolescent red lunules from costa to inner margin, replaced costally by dark green. On the outer margin is a band of hoary maroon, basally scalloped from M_1 to the anal angle. Anal lobe maroon. *Fringe* of both wings white-gray, darker at the vein-ends.

Length of fore wing. Female, 15 mm.

Holotype. Female, San Pablo, Rio Pastaza, vic. Baños, Ecuador, 2200 meters(?), (Clark-MaeIntyre), ex coll. F. M. Brown, in the American Museum of Natural History.

Remarks. This subspecies differs from typical *agricolor*¹ in several respects, namely: the absence of the marginal hoary band on the fore wing below, reduction in size of the black basal patch of the hind wing below, and the reduced size of the marginal band of the hind wing below, and its differentiation into two bands. The blue color above is very bright, far brighter than in any other female of this group thus far examined (except for a single female of *pseudolongula*, of almost the same intensity). This character, however, is in all likelihood of no significance, being merely an age factor.

This subspecies, with its reduced markings below, strongly suggests a transition from *agricolor* to *remus*; which, in turn, may connect to *pseudolongula*. Many more specimens are needed, however, before

¹The Jalapa, Mexico, specimens and the holotype of *bañosensis* were compared with Butler's figure in the Cist. Ent. (I.c.) and the former agreed almost perfectly. They were therefore used in the following comparison as typical *agricolor*, even though not topotypical.

this suggestion can be proven or denied. Genitalic examination would help considerably.

2. THECLA REMUS Hewitson

Thecla remus Hewitson, 1868, Descr. Lycaenidae, p. 34; 1877, Ill. Diurn. Lep. Lycaenidae, p. 201, pl. 80, figs. 655-656; Draudt, 1919, in Seitz, Macrolep. World, 5, p. 763, pl. 154b.

Thecla deidamia Burmeister, 1879, Atlas de la Descr. Phys. Rep. Argentine, 5, pt. 2, p. 24.

Described from Brazil. Type (female) is presumably in the British Museum, although Mr. Goodson (who examined the British Museum's specimens of the present group for me) wasn't exactly clear on that point in his notes. Draudt in Seitz gives no additional information, and does not seem to have known the species. Burmeister records it (as *deidamia*) from Las Conehas, north of Buenos Aires, Argentina. Four specimens, all females, in the M.C.Z.: three from Blumenau, Sta. Catharina, Brazil, and one, ex coll. J. Doll, labelled "Brazilia." One male, in the American Museum of Natural History from "Massaranduba-Blumenau, Brazil."

Male above brilliant iridescent blue, violet-tinted in some lights. Both wings edged with black on the outer margins. Hind wing gray on costa and inner margin. Anal lobe dull maroon.

Below, the male is green on both wings. Fore wing with gray on inner margin to Cu_2 , darkened basally. Hind wing with a marginal row of hoary, reddish-gray spots, almost connected. A discal row of obsolescent, irregular spots crosses the wing, between which and the marginal row of spots is a suggestion of a row of red dashes, in $M_3-Cu_1-Cu_2$. Anal lobe dark maroon.

The female above with the blue much duller and more restricted; quite similar in appearance to the females of most of the other species of the group. Anal lobe rusty. Below green, with the inner margin of the fore wing gray, darker basad. Hind wing on the outer margin with a series of internervular, almost round, reddish gray spots. This wing crossed in the disk by a rather tortuous line of white, interrupted frequently, and of varying intensity, basally edged with blackish. Between this line and the marginal spots are one or two, rarely more, red dashes, slightly crescentiform. Anal lobe dark maroon. Hewitson's descriptions (1868, 1877) of the female tallies quite well with what is here regarded as *remus*, save for a few minor differences. The fulvous patch at the outer angle of the hind wing below mentioned by Hewit-

son is very likely the result of wear. He mentions in both descriptions a band of three or four spots on the fore wing below, near the costa. No indication of such spots was found on the four specimens examined. He does not mention the submarginal series of three or four crescentiform dashes on the hind wing. This character, however, is apparently variable, being lacking in one of the four M.C.Z. specimens, and almost lacking in another. On the strength of these apparent differences it was decided not to select a type locality for *remus* until either specimens are found that match more closely the description, or it is proven that he had a slightly aberrant example.

The male agrees quite well with Hewitson's 1877 description and figure, save for the "green tint" he speaks of. This, however, is frequently caused by chemical action, and can be overlooked. It is above close to males of *pseudolongula*, but may be separated by the broader, more apically thickened outer marginal border.

Thecla deidamia is a name that ever since its publication in 1879 appears to have been almost overlooked. Seitz made no mention of it, and the only published reference of it known to the author is that of Weeks (see synonymy under *portoena*).

Weeks referred his name to "Ruschew.", but this is in error, as a glance at the original description will show. Ruscheweyh collected the specimens, noted that they were probably new, and suggested the name *deidamia* (*in litt* to Burmeister, apparently). Burmeister, however, wrote the description and applied the name to it, wherefore it must go to him.

With regard to the present placing of the name, it can be said only that a comparison of Burmeister's description with Hewitson's descriptions and figures (1868 and 1877) and several specimens of *remus* revealed an almost perfect resemblance. Burmeister's locality (Las Conchas, nr. Buenos Aires, Argentina) is quite in accord with our present knowledge of the distribution of *remus*, although extending its range somewhat southward.

3. THECLA PSEUDOLONGULA, new species

Thecla longula: Hewitson, 1877, Ill. Diurn. Lep. Lycaenidae, p. 200, pl. 80, figs. 651, 652, 653, 654; Draudt, 1919, *in* Seitz, Macrolep. World, 5, p. 762, pl. 154a. (*nec* *T. longula* Hewitson, 1868 (q.v.)).

Eyes narrowly ringed with white. *Frons* with two parallel rows of long, partially erect, dark brown hairs, flanked outwardly (along the rims of the eyes) with a row of rusty scales on each side and a band of

shorter hairs, with rusty ones intermingled, between them. Caudad of the antennae is a transverse row of long rusty hairs. *Collar* of long hairs, bluish and rusty on top, becoming intermingled with white on the sides. *Palpi* rusty outwardly, bluish white within; terminal joint completely rusty. *Antennae* black above, white annulate below; club black, tipped with fulvous and paler below (becoming white basad). *Thorax* of the male above metallic blue or green, overlaid moderately with long, anally directed hairs, heaviest next the abdomen; female paler, more steely blue above; male below covered with dense brown hair, paler in the female. *Abdomen* of the male above metallic blue, very bright; below, yellow; tip above and below gray: of the female, duller, the blue more steely and more anteriorly restricted; below similar. *Legs* (absent in most of the specimens examined) apparently brown, tarsi black and white annulate.

UPPERSIDE:

Male. Bright metallic blue, greenish in some lights, purplish in others. The scent pad is so small as to be almost unnoticeable, consisting merely of a short row of scales along the upper disco-cellular at the cell-end. A marginal border, about 1 mm. thick, edges both wings. On the fore wing it is slightly thicker than on the hind wing, and towards the apex it expands still more (2-3 mm.). The anal lobe is prominent and rust-colored. *Fringe* brown on fore wing; dull white on hind wing, basally and at the vein-ends darker.

Female. Dull gray-blue, with very broad blackish borders, somewhat narrower and basally crenulate on the hind wing. Anal lobe as in the male. *Fringe* also as in the male.

UNDERSIDE:

Male. Both wings bright emerald-green, with the inner margin of the fore wing broadly gray. The hind wing is marked by two transverse bands of lighter green, rather indistinct, basad to the inner of which is a suggestion (consisting usually of one or two obscure points) of a post-discal line. In the extreme base is a smallish dark brown area. Anal lobe rusty and adjoining it in the Cu_2-2A interspace is an obscure rusty-hoary patch.

Female. Similar, but the markings more distinct.

Length of fore wing. Male, 13.5-15 mm.; female, 14-14.5 mm.

Holotype. Male, Mapoto, Ecuador, ex A. G. Weeks collection.

Allotype. Female, no locality, ex R. M. Gray collection.

Paratypes. On male, R. Guamlo (or Guamba-label poorly written), Ecuador, ex A. G. Weeks collection; one male, "Colombia", Oct. 10, 1913, ex F. A. Eddy collection; two males, no locality (possibly

Bogota, Colombia), ex A. G. Weeks collection; one female, no locality ("So. Am."), ex C. J. Paine collection; two males, one female, vic. Baños, Ecuador (Clark-MacIntyre), as follows: one male, Tunguragua, 1900 meters, March, 1939; one male, Runtun, 2000-2500 meters, Nov. 26, 1938; one female, Rio Blanco, 1700-1900 meters, Oct. 19, 1938.

Holotype, allotype, and three male paratypes, no. 26223 in the Museum of Comparative Zoölogy. One male and one female paratype in the author's collection. The last three paratypes in the collection of the American Museum of Natural History.

Remarks. Quite different from true *longula*, for comparison with which, see under that species. The closest ally of *pseudolongula* yet discovered appears to be *longuloides*, from which it differs in the smaller scent-pad, broader borders and larger anal lobe. It is also allied to *remus*, but that species has a marginal row of hoary spots on the hind wing below.

4. THECLA LONGULOIDES, new species

Eyes hairy, narrowly ringed with white. *Frons* consisting of two parallel rows of long, erect, dark brownish hairs, thickly intermingled with rusty ones. Just outside these rows, paralleling the white eye-margin, is a row of rusty scales. Basad of the antennae is a transverse row of rusty hairs, and between the antennae a few white ones. *Collar* of long, rusty and brown-black hairs. *Palpi* outwardly covered with mingled pale blue, rusty and gray scales, inwardly almost entirely pale-blue. *Antennae* black above, white annulate below; club black above, below tipped with dull fulvous, backed by white. *Thorax* of the male above metallic greenish blue, covered, chiefly on the periphery (behind the head, along the sides above the wing bases and anterior to the abdomen), with long, grayish-rusty hairs; thorax of the female grayer blue above, without the greenish tinge: below tufted with brown in the male, paler in the female. *Abdomen* of the male above brilliant metallic green, below yellow; tip gray above and below; abdomen of the female with the blue more anteriorly restricted above (the remaining area gray); below as in the male. *Legs* black and white annulate.

UPPERSIDE:

Male. Both wings brilliant metallic blue, greenish in some lights and purplish in others. *Fore wing* with an almost linear black scent-pad lying along the upper discocellular at the cell-end. *Costa* very

narrowly, outer margin slightly more broadly black-bordered. The latter thickens apically and extends briefly basad on each vein. *Hind wing* with costa and inner margin gray. Outer margin narrowly black, also extending basad for a short distance on the veins. Anal lobe small, rusty colored. *Fringe* of fore wing brown, paler outwardly; of hind wing similar, but whitish outwardly between the veins.

Female. Both wings dark gray-brown, costa and inner margin of hind wing pale brown. *Fore wing* with dull steely blue from inner margin to upper discocellular, from base to cell-end, outwardly down to inner margin three-quarters out. *Hind wing* similar, leaving only a narrow dark border on the outer margin, hazy and indistinct basad, that thickens slightly towards the outer angle. Anal lobe as in the male. *Fringe* as in the male, but darker.

UNDERSIDE:

Male. Both wings uniform green. *Fore wing* with the inner margin to just over Cu_2 gray, becoming sharply black along the lower discocellular. *Hind wing* with two very faint and obscure small white spots, each lined basally with a few red scales: one post-discal in the Cu_1 - Cu_2 interspace; the other submarginal in the 2A-3A interspace, touching 2A. The faintest indication of a submarginal band, almost unnoticeable, consists merely of a very slight darkening of the green. *Fringe* as on upper surface. Anal lobe obscurely dark rusty colored.

Female. Similar to the male, but lacking the black along the lower discocellular of the fore wing, and with the faint submarginal band of the hind wing a little more prominent. The green on the outer margin of the fore wing extends down more into the Cu_2 -1A interspace.

Length of fore wing. Male, 14 mm.; female, 13 mm.

Holotype. Male, Coroico, Bolivia, May, 1899 (Wm. J. Gerhard), ex A. G. Weeks collection.

Allotype. Female, Chulumani, Bolivia, Dec. 12, 1898 (Wm. J. Gerhard), ex A. G. Weeks collection.

Holotype and allotype, no. 26224 in the Museum of Comparative Zoölogy.

Remarks. This species is allied to *pseudolongula*, but may be distinguished from it, in the male, by the much narrower outer marginal border above, and the presence of a larger, more definite scent-pad. Both sexes have a considerably reduced anal lobe on the hind wing (less than half the size of that occurring on *pseudolongula*). Below the green is more uniform than in *pseudolongula*, with the light and dark transverse bands almost non-existent. In the female the outer margin of the fore wing does not seem to be so convex as in that sex of *pseudo-*

longula, and the blue appears to be duller, although of about equal extent.

5. THECLA LONGULA Hewitson

Thecla longula Hewitson, 1868, Descr. Lycaenidae, p. 34. (nec *longula*, Hewitson, 1877, and others).

Strymon pastor Butler and Druce, 1872, Cist. Ent., **1**, p. 105; Butler, 1873, Lep. Exot., p. 157, pl. 57, fig. 5; McDunnough, 1938, Mem. S. Cal. Acad. Sci., **1**, p. 24 (no. 364).

Thecla pastor: Godman and Salvin, 1887, Biol. Centr. Am. Lep. Rhop., **2**, p. 34, pl. 52, figs. 8, 9, 10; Draudt, 1919, in Seitz, Macrolep. World, **5**, p. 762, pl. 154a; Hoffman, 1940, An. Inst. Biol. Mex., **11**, p. 707.

The type apparently is not in the British Museum. Mr. F. W. Goodson, at Tring, informs me through Dr. Riley that there is no specimen of *longula* (by which he meant *pseudolongula*, probably exclusively) in the British Museum from Central America. The four specimens of "*longula*" from the Hewitson collection are all referable to *pseudolongula*.

Five specimens of *longula* have been examined and compared with the description. They seem typical, and in the absence of a type are made neotypes, as follows:

Neoholotype. Male, Orizaba, Mexico, June 1941 (Stallings and Turner).

Neallotype. Female, same data as above.

Neoparatypes. One female, same data as above; two females, Presidio, Mexico, June 1941 (Stallings and Turner).

Neoholotype and Neallotype deposited in the Museum of Comparative Zoölogy. One neoparatype in the collection of the author. The remaining returned to the collection of Mr. D. B. Stallings and Dr. J. R. Turner.

This species has been subjected to a rather peculiar misidentification, for almost the whole of its existence in the literature to date. Hewitson's original description of *longula* is of a totally different insect from that of his description and figure of 1877 (in the "Illustrations"), as can be seen from the following extract from it (1868): "Underside dull green, tinted with orange at the apex of the anterior wing¹. Posterior wing without tails:² crossed beyond the middle by

¹Probably due to wear: see under *renus*.

²Evidently variable in this species. One of Godman and Salvin's illustrations of *pastor* showed tailless, and one of the type (neotype) series of *longula* is also naturally without tails. Possibly the species is in a state of either losing or acquiring them.

two bands of indistinct distant red-brown spots: a series of marginal red-brown spots, irrorated with white: the lobe red-brown." Comparing this description with that of his published 1877 (*pseudolongula* of this paper) shows immediately that the two are not conspecific. When the above description was checked against *pastor*, the true identity of the name was shown.

6. THECLA LEGIONIS, new species

Eyes hairy, ringed with white or pale green. *Frons* green. *Collar* and *palpi* in the present specimen indiscernible. *Antennae* black and white annulate, nearly all black above; club black, tipped with fulvous, more extensive and white-backed below. *Thorax* pale steely blue above, fulvous beneath, rather pallid where visible. *Abdomen* gray above (pale bluish basad), cream below.

UPPERSIDE:

Female. Both wings steely blue. *Fore wing* broadly black on costa, apex and outer margin. *Hind wing* more narrowly so on outer margin. *Costa* and *inner margin* gray. *Anal lobe* rusty. *Fringe* of fore wing blackish, slightly paler outwardly; of hind wing sordid white, darker at the vein-ends.

UNDERSIDE:

Female. Both wings green. *Fore wing* with inner margin from Cu_2 gray. Cu_2 and outer margin along this gray are fulvous. Base of gray, adjoining cell, darker. *Hind wing* unmarked save by a series of obscure reddish dashes in the M_2-2A interspaces slightly basad of the submarginal area, and two almost unnoticeable white costal spots, one each in the $Sc-Rs-M_1$ interspaces. Outward of the reddish dashes the green seems a little paler. *Fringe* of fore wing fulvous, outwardly obscured by gray. Of hind wing fulvous, outwardly whitish, darker at the vein-ends.

Length of fore wing. Female, 12.5 mm.

Holotype. Female, Blumenau, Sta. Catharina, Brazil (B. Pohl), no. 26225 in the collection of the M.C.Z.

Remarks. This species, unfortunately represented by but a single female, appears to stand closest to *acaste*. It has the green frons of *acaste*, but the almost unproduced anal angle of, for example, *remus*. Below it looks somewhat similar to a small *acaste* without a discal white line on the hind wing. Above, the blue is slightly paler than in females of *acaste*, but this may be due to fading. Below *legionis* differs from typical *acaste* (which subspecies it most closely resembles)

in the almost complete absence of a discal white line, the only indication being two almost costal white spots, so faint as to be hardly discernible. The fringe is also more fulvous than in either subspecies of *acaste*. The fulvous edging of the inner marginal area of the fore wing below is also absent in both *acaste* and *catharinensis*, but this character, like the fulvous patches mentioned by Hewitson in the descriptions of *longula* and *remus*, may be due to wear.

7. *THECLA ACASTE ACASTE* Prittwitz

Thecla acaste Prittwitz, 1865, Stett. Ent. Zeit., **26**, p. 318; Draudt, 1919, in Seitz, Macrolep. World, **5**, p. 763, pl. 154a.

Thecla lycimna Hewitson, 1868, Descr. Lycaenidae, p. 33; 1877, Ill. Diurn. Lep. Lycaenidae, p. 203, pl. 80, figs. 663, 664, 665.

The type locality of *acaste* is Corcovado, near Rio de Janeiro, Brazil. Under his *lycimna* Hewitson (1877) merely gives "Brazil."¹ Mr. Goodson has examined the Hewitson type for me, and it is apparently quite in accordance with Prittwitz' original description, and has the characters here used to separate true *acaste* from *catharinensis*. Rio de Janeiro, Brazil, is here selected as the type locality of *lycimna*, thus better insuring its permanent synonymy. The type of *acaste*, Mr. Goodson suggests, is probably either in Munich, Berlin, or Greiswald, granting the collections at those localities to be still intact.

Draudt gives as records: Sao Paulo, Santa Catharina and Rio Grande do Sul. The last two will probably refer to *catharinensis*. Seven examples in the M.C.Z., Rio de Janeiro and Canto Gallo, Brazil. The range of this, the typical subspecies, appears to be quite limited.

The male above is generally similar to *longuloides*, but with the scent-pad concolorous with the ground. The ground color is slightly duller than in *longuloides*, especially marginally, and the outer margin is more broadly black. Below it is uniform green, with a gray inner margin on the fore wing, an obsolescent white transverse line on the hind wing running from costa to inner margin, outward of which is a row of tiny bright red spots or dashes, the most prominent in Cu_1 - Cu_2 .

Female above similar to the female of *pseudolongula*, but with the outer limits of the blue less definite. Below as in the male.

Both sexes differ greatly from *pseudolongula* and *longuloides* in the possession of a green frons.

Length of fore wing. Male, 15-15.5 mm.; female, 14-16 mm.

¹The original description (1868) cited no locality whatsoever.

7a. *THECLA ACASTE CATHARINENSIS*, new subspecies

Thecla acaste: Draudt, 1919, in Seitz, Macrolep. World, 5, p. 763 (*partim*).

UPPERSIDE:

Male. Both wings dully shining violet blue, deepening slightly towards the margin. Outer margin of both wings narrowly black, thickening slightly towards the apex on the fore wing. Costa of fore wing also narrowly black. Costa and inner margin of hind wing gray, the latter shaded basally with bluish. On the hind wing the anal lobe is rusty, fringed with black.

Female. Both wings black-brown with the basal two-thirds of the fore wing and the majority of the hind wing dull steely blue, leaving a costal, broad apical, narrower outer marginal dark border on the fore wing, and a gray costa and inner margin on the hind wing, with a still narrower dark outer marginal border. Anal lobe as in the male.

UNDERSIDE:

Male. Both wings bright green. *Fore wing* inner margin gray to Cu_2 , the green encroaching only at the outer margin. Base of this gray area dark along the lower *De*. *Hind wing* with a prominent, mildly tortuous white line, basally and obscurely bordered with red. This line commences two-thirds out on the costa and proceeds nearly straight to three-quarters out on inner margin. Anal lobe black, shading into deep red basad. A few minute black scales in the submarginal area.

Female. Similar to the male.

Length of fore wing. Male and female, 14 mm.

Holotype. Male, Santa Catharina, Brazil, ex A. G. Weeks collection.

Allotype. Female, Blumenau, Sta. Catharina, Brazil (B. Pohl).

Paratype. One female, "Brazilia", ex J. Doll Collection.

Holotype and allotype, M.C.Z. no. 26226. Paratype in the collection of the author.

Remarks. Differs from typical *acaste* in the more prominent and complete white line on the under surface of the secondary, in the absence of the submarginal red dots or dashes on the same wing below, and, in the male, by the reduced marginal border above.

8. *THECLA PORTOENA*, new species

Thecla deidamia: Weeks, 1905, Ill. Diurn. Lep. (Ill. Unfig'd. Lep.), 1, p. 19.

(*nec deidamia* Burmeister: see under *remus*. The identity of the insect Weeks called *deidamia* (loc. cit.) is determined by three specimens so labelled in his collection, which are now made the types of *portocna*.)

Eyes hairy, ringed with white. *Frons* green. Collar dark rusty above, shading to whitish below. *Palpi* rusty pale gray, dorsally dark brown. *Antennae* black, white annulate below, and very faintly above; club black, tipped with dull fulvous. *Thorax* dull black, covered with bluish hairs, lightly on top, heavier laterally and next the abdomen; below grayish tan. Abdomen above blue next the thorax, gray thence to tip; below yellow, gray at the tip. *Legs* black and white annulate.

UPPERSIDE:

Male. Both wings shining lavender blue, deepening towards the margin. *Fore wing* with a rather broad, dark brown marginal border, thickening apically. Costa with a similar, but narrower border. *Hind wing* with costa pale gray. Inner margin gray, overlaid basad with bluish scales. Basal area of wing overlaid with pale scales, giving a rather hoary appearance to this region. Outer margin narrowly black-brown, extending slightly basad on the veins. Anal lobe rusty, black-fringed. *Fringe* of fore wing dark basally, paler outwardly; of hind wing dark, white outwardly between the veins.

UNDERSIDE:

Male. Both wings uniform green. *Fore wing* with the inner margin gray-tan, with a white patch on the center. The green encroaches on this gray-tan at the outer margin. Base of this area somewhat darkened. *Hind wing* with a nearly straight white discal line, basally edged with a few red scales, that runs from the costa towards the inner margin, but disappears at about M_3 or Cu_1 . A submarginal series of thin red dashes occupies the M_2 -2A interpaces, and occasionally even further costad. Anal lobe deep red, almost maroon, extending slightly, in the form of a compact small area of reddish irroration, into the Cu_2 -2A interspace.

Length of fore wing. Male, 12-13.5 mm.

Holotype. Male, Cusilluni, Bolivia, May, 1899 (Wm. J. Gerhard), ex A. G. Weeks collection.

Paratypes. Two males: one male, same data as holotype; one male, Coroico, Bolivia, April 20, 1899 (Wm. J. Gerhard), ex A. G. Weeks collection.

Holotype and one paratype, M.C.Z. no. 26227. One paratype in the author's collection.

Remarks. *T. portocna* may be distinguished from both typical *acuste* and its subspecies *cathariensis* as follows: the marginal border of the fore wing above (male) is broader than in either; below, the white line on the hind wing disappears before reaching the inner margin,

while in both *acaste* and *a. catharinensis* it proceeds all the way; the anal lobe is here smaller than in either, and colored deep red, while in *acaste* and its subspecies it is black; the inner marginal area of the fore wing below is here gray-tan, and has a central white patch, while in *acaste* and *catharinensis* it is gray and has no such patch (in fact *portoena* is the only species at present known to the writer that possesses such a peculiar pattern character); *T. portoena* has the red submarginal spots as in *acaste* (*s.s.*), but they are more linear, and seem to extend further costad.

It is possible that *portoena* may be only a subspecies of *acaste*. The differences between them, however, are such that two full species seem involved, and while at present *portoena* seems to be a local representative of *acaste*, further knowledge of the distributions of the involved forms may prove otherwise.

9. THECLA MARIALIS, new species

Eyes ringed with pale green. *Frons* green. *Palpi* fulvous, scaled outwardly with green; terminal point black. *Collar* above green, with pale greenish and fulvous hairs, shading to sordid gray on the sides. *Thorax* above black with dull greenish-gray hairs frontad, laterally, and next the abdomen, all back-directed; below covered with pale rusty long hairs. *Abdomen* black-brown above, yellow below, dark gray at the tip. *Legs* gray, with pale annulations.

UPPERSIDE:

Male. Both wings black-brown. *Fore wing* with the basal area overlaid with dull olive-green, extending marginad roughly two-thirds. On the upper cell-end is an elongated black scent-pad, rather small. *Hind wing* similar but with the olive-green shading restricted more basad. Anal lobe fulvous, this color extending basad along inner margin for one-third its length, and along outer margin almost to Cu_2 . Tail at Cu_2 , very short, but definitely present. *Fringe* of both wings gray with a brownish tinge.

UNDERSIDE:

Male. Both wings emerald-green. *Fore wing* with inner margin to Cu_2 gray, darkening to almost black, next the cell, and to darker gray on the outer margin. *Hind wing* with an almost non-existent indication of a post-discal line, the only real relic being a tiny white spot in Cu_1-Cu_2 , capped by a minute red bar. Anal lobe dark maroon, capped thinly basad by a white line.

Length of fore wing. Male, 13 mm.

Holotype. Male, Victoria, Mexico, February 7, 1942 (Mrs. Mary Alice Turner), no. 26569 in the Museum of Comparative Zoölogy.

Remarks. From the remaining species of the group now under consideration this species differs most remarkably in the utter absence of the brilliant morpho-blue that characterizes the males. Other distinguishing characters are: the Cu_2 tail, present only in this species and in *longula*; and the spread of fulvous from the anal lobe above. The other differences are of less importance, but can be noted by referring to the formal description above.

This species is a striking parallel to *Thecla fusius* Godman and Salvin¹, which belongs to the "tailed section" of Draudt's *amyntor*-group. *Fusius* (of which also only the male is known) is uniformly brown above, but below is described and figured as being exactly similar to *herodotus* Fabr.² From Godman and Salvin's figures the following presumably significant differences have been noted: The hind wing is longer, more produced anally (a character of the *acaste* group, as opposed to the remainder ("tailed section") of the *amyntor*-group); there is a very plain anal suffusion of fulvous in *marialis*, of which no indication is given either in Godman and Salvin's description, or their figure; nor is there, in *marialis* any indication of the bluish suffusion in the base, as depicted in their illustration; below there is no white line on the hind wing of *marialis*, while the figure of *fusius* plainly shows one, and in which *fusius* also agrees with *herodotus*.

There seems little doubt, therefore, that in spite of the superficial resemblance, we are dealing with a full species, belonging even to a separate subgroup.

The collector of this subspecies, Mrs. Mary Alice Turner, said that she could not recall taking the specimen itself, but remembered that collecting at Victoria was done by an irrigation ditch, on low weeds in open country away from the forest.

The author wishes to thank Mr. Don B. Stallings, of Caldwell, Kansas, in whose collection the specimen formerly rested, for his kind donation of it to the Museum of Comparative Zoölogy.

¹ 1877, Biol. Centr. Am. Lep. Rhop., 2, p. 34, pl. 52, fig. 6, 7.

² Godman and Salvin state that the pattern below of *fusius* is so similar to *herodotus* that, in the absence of females, they were almost inclined to regard it as a dimorphic male of that species.